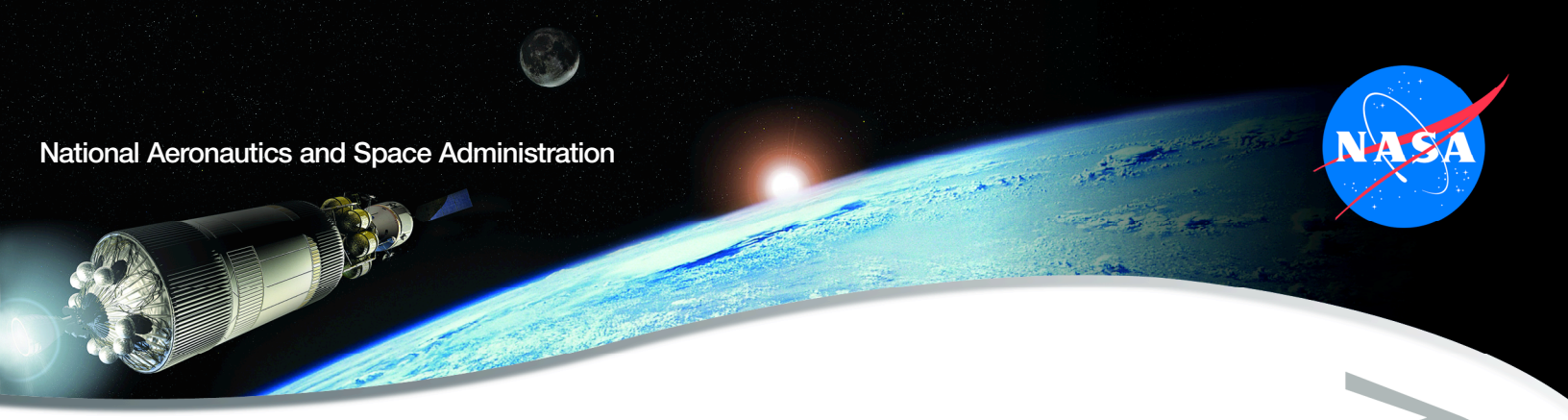

CSTL

Creating a High-Fidelty, End-to-End IP Communications Environment

goddard technology

About the Lab

The Communications, Standards, and Technology Lab (CSTL) provides a high-fidelity, end-to-end IP communications test and demonstration environment for the NASA Space Communications and Navigation Standards and Technology programs. Located at the Goddard Space Flight Center, the CSTL is ideal for space communications and navigation studies, Constellation C3I and lunar surface studies, and space network and ground network technology activities.

Current activities include software-defined radio, Distruption-Tolerant Networking (DTN) protocol, networking and communications demonstrations, and flight software applications. The testbed is currently configured to demonstrate IP-based communications in a multi-node environment that can model ground, flight, and lunar-surface assets.

Significance of the Lab

The lab's high-fidelity flight and ground hardware and software, combined with its flexibility to test end-to-end scenarios, provide NASA with a unique capability to develop, test, and demonstrate standards, new technologies, and concepts all in one place.

Origins

The Goddard Flight Software and RF Systems Laboratory combined to create an end-to-end IP-based communications testbed. The lab has since grown from a ground station and single spacecraft to a multi-spacecraft configuration, based on Constellation C3I interoperability specifications. Recently, CSTL was reconfigured to support lunar-surface system concepts. In addition, the Center has recently added innovative technologies to demonstrate future enabling capabilities.

Benefits of the Technology: At-A-Glance

- Standards and technology development and testing
- Constellation/C3I and lunar surface trade studies
- Communication and tracking network studies
- Operations concept demonstrations

Looking Ahead

In-work and future activities include:

- Software-defined/cognitive radio technology
- Wireless communications
- NASA's Inter-Center Space DTN Readiness Project
- External interfaces with JSC O-Ring Test Fixture, JPL Protocols Test Laboratory, Distributed System Integration Lab, and the DTN Experimental Network
- Networking functionality demonstrations/tests, including DTN and IP trade studies, dynamic routing, IP security, IPv4/IPv6 comparisons, and communications testing
- Constellation prototype RF hardware
- Communications Navigation Networking Reconfigurable Testbed
- Standards testing, including asynchronous message service and space link extension

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